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Third type boundary conditions for steady state ambipolar diffusion equation

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Abstract

© Published under licence by IOP Publishing Ltd.A third type boundary condition for boundary value problem of electron balance in inductively coupled radio-frequency (ICRF) discharge is described. It is assumed that directions of diffusion and drift flows on boundary through the positive charge layer are coincided. Herein we study the effect of different boundary conditions on the parameters of ICRF discharge by computational solution of eigenvalue problems. It is showed that electronic temperature at boundary conditions derived in this study differ from the electronic temperature at boundary condition which mean a complete recombination of charged particles on the wall of gas discharge chamber (DC). The derived boundary conditions can be used for modelling ICRF discharges to determine optimal parameters of plasmatrons.

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